



POWERTECH (USA) INC.

**Powertech (USA) Inc.
Dewey-Burdock Project
Class III Underground Injection Control
Permit Application**

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Prepared for
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3.0 ATTACHMENT B - MAPS OF AREA AND AREA OF REVIEW

The map of the project area and AOR is provided as Plate 3.1. The proposed aquifer exemption boundary is provided on Figure 17.1 in Section 17. The information provided on Plate 3.1 is described below.

3.1 Area of Review

Plate 3.1 is a topographic map that covers the entire AOR and describes the following information:

- The proposed permit boundary/project area
- AOR boundary (discussed in Attachment A)
- Existing wells
- Surface bodies of water
- Historical mines (surface and subsurface)
- Residences
- Roads
- Faults

Wells depicted on Plate 3.1 are color coded to designate aquifer of completion and depth of completion. Powertech is aware of 17 domestic wells within the AOR (see Section 4.1), not all of which are drinking water wells or associated with currently inhabited or inhabitable residences. No drinking water wells are located within the requested aquifer exemption boundary and completed within the mineralized Inyan Kara Group (see Section 17.3).

No injection wells, intake structures, discharge structures, or hazardous waste treatment, storage, or disposal facilities have been identified in the AOR. Class V injection wells are proposed for the Dewey-Burdock Project as discussed in Section 10.1. There are no natural springs within the project area. There is, however, an isolated area in the southwest portion of the Burdock area, known as the “alkali area,” where groundwater is discharging to the surface, presumably through unplugged or improperly plugged exploration boreholes. There are also two springs outside of the project area but within the AOR. These are discussed in Section 4.3. No quarries are located within the AOR; the nearest quarry is located on the GCC Dacotah property north of the project boundary.

Attachment C (Section 4) describes the inventory of existing wells, exploration drill holes, and oil and gas wells and test holes. The following section describes the historical mines in the AOR.

4.0 ATTACHMENT C - CORRECTIVE ACTION PLAN AND WELL DATA

This attachment details the inventory of water wells, monitor wells, exploration drill holes, and oil and gas wells located within the AOR. It also describes Powertech's corrective action plan to prevent movement of ISR fluids into USDWs.

4.1 Well Inventory

Historical records and field investigations conducted within the 2-km (1.2-mile) AOR were used to develop the well inventory. An initial investigation of the wells was completed in 2007, and additional surveys were conducted in 2011 to evaluate the use and condition of the wells. A total of 122 wells have been identified within the AOR. There also are 27 wells with historical records that currently are not present at the surface and 17 wells with historical records that have been visually confirmed as plugged and abandoned. Appendix A contains the well inventory summary tables, and Appendix B contains the detailed well inventory, well completion records and associated documentation. Plate 3.1 depicts existing wells within the AOR.

Table 1 in Appendix A summarizes the well inventory. Listed wells have one of the following uses:

- Domestic: Are currently used or reasonably can be expected to be used for domestic water use (e.g., drinking, washing, sanitary use, etc.), including wells which also are used for livestock watering. This category also includes formerly used domestic wells which through agreements with Powertech no longer will be used as drinking water wells (17 wells)
- Stock: Watering of livestock is sole use; well cannot be used for domestic water use (i.e., no piping to domestic water system, etc.) (44 wells)
- Irrigation: Permitted to be used for irrigation (1 well)
- Monitor: Sole use is for monitoring (60 wells)

Table 2 in Appendix A lists the wells identified in historical records that were not evident at the surface during the field investigations. These wells are depicted on Figure 4.1. Several of these wells are suspected of being plugged and abandoned. Powertech will continue to search for these wells. During design of well fields, pump testing will be designed to locate any such wells and to detect any potential impacts from such wells on the ISR operations.

Table 3 in Appendix A lists all of the wells within the AOR that have been confirmed by Powertech to have been plugged and abandoned. Each well was visually inspected, and it has been determined that cement was placed within the well bores.

4.2 Oil and Gas Well Inventory

No formerly producing or actively producing oil and gas wells exist within the project boundary or within the AOR. Within the AOR, the locations of 13 plugged and abandoned oil test wells have been identified, 3 of which are within the project area. The locations of these abandoned test wells are depicted on Plate 3.1.

4.3 Exploration Drill Hole Inventory

As typical of a site proposed for ISR uranium extraction, historical exploration holes are present within the project area. Appendix C summarizes the available information for historical drill holes within one mile of the project area, including TVA and Powertech drill holes. While the exploration drill hole inventory area is slightly smaller than the AOR (1-mile inventory versus 1.2-mile AOR), it extends well beyond the area potentially affected by ISR operations and the area where exploration holes could potentially impact ISR operations. Exploration hole locations are depicted on Figure 4.2.

4.3.1 Evaluation of Potential Discharges to Alluvium through Unplugged Exploration Holes

Powertech performed extensive investigation into all surface water features within the project area. This included field investigations during the initial baseline monitoring period and the use of color infrared (CIR) imagery. All surface water features and sources of groundwater flow to the surface are believed to have been identified within the project area.

With one exception, groundwater discharging to the ground surface is limited to flowing artesian wells, which will be controlled and mitigated as described in the correction action discussed below. The only feature identified that was indicative of groundwater discharge from exploration boreholes at or near surface was the “alkali area” in the southwestern corner of the Burdock portion of the project area (N/2 NE/4 Section 15, T7S, R1E). This is an area of known discharge from the Fall River and Chilson to the surface through abandoned exploration holes documented by TVA. The significance of this area as it relates to ISR operations will be evaluated further after NRC license issuance during delineation drilling and well field-scale pumping tests prior to any well field development.

4.3.1.1 CIR Imagery

To evaluate possible groundwater discharge to the alluvium within the Beaver and Pass Creek drainages, CIR satellite imagery was obtained from the National Agriculture Imagery Program (NAIP) of the USDA Farm Services Agency for the project area and vicinity. The imagery was photographed in 2010 and produced with a resolution of one meter. CIR imagery is commonly used to delineate areas of active vegetative growth; in semiarid regions such as the project area,